observed agreed with a centre at $43^\circ + 57^\circ$, but others were directed from η Persei, and others again from the cluster at χ Persei. On August 10 the writer, at Bristol, watched the eastern sky from 13h. 46m. to 15h. 17m., and saw 19 meteors, of which 17 were Perseids from a well-defined radiant at $45^\circ + 55^\circ$. This is about 2° S. of the correct place. More meteors would have been seen but for the interference of passing clouds.

On August 11, between 10h. and 11h. at Bristol, 11 meteors were observed, including 7 Perseids with radiant at $44^\circ + 58^\circ$. Clouds were again very prevalent, and greatly restricted the view.

On the same night, Prof. Herschel, at Slough, had a clear sky from 9h. 50m. to 12h., and mapped twenty-six meteors, a great majority of them being Perseids. Many of the meteors were bright, and Prof. Herschel regarded the maximum frequency as occurring on this date. "Besides Perseids, a few bright meteors diverged from Pegasus, Pisces, and the head of the Lynx. A pseudo radiant (probably) of the Perseids presented itself at $46^\circ + 63\frac{1}{2}^\circ$. But the body of the Perseid radiation is very scattered—only the tail end of the shower being here recorded very likely—and a large area enclosing γ, τ, η, χ Persei and H, B, C, D Camelopardi, with its centre at about $43^\circ + 58^\circ$, near k Persei, is the best approximation that can be gathered from the tracks registered."

A fourth magnitude meteor, moving swiftly, was seen at 10h. 7m. both at Slough and Bristol. Height at beginning, 78 miles; at end, 62 miles. It passed from over Brackley (Northampton) to Farringdon (Berks). Real length of path, 30 miles; earth-point, 10 miles south-west of Portland, Dorset. The radiant was at $48^\circ + 60^\circ$, the meteor being a true Perseid.

From the various reports already received, it appears certain that this year's display has been far from presenting a conspicuous character. This has probably not proceeded from any special weakness in the shower itself, but from the unsuitable circumstances which have attended its return. Moonlight is a most serious obstacle in the way of meteoric work, and when, added to this, the observer is confronted with skies more or less clouded, the chances of success become very remote. But, in spite of these untoward conditions, the shower has by no means passed unobserved; many of its brilliant meteors have been recorded, and the radiant point has been determined on several nights. Some of the chief contemporary systems have made their presence known by some fine objects, and the results on the whole may be regarded as very satisfactory.

W. F. DENNING.

SIR JOHN TOMES, F.R.S.

ANOTHER of the small band of histologists, who took up the subject when the field was almost untrodden, has passed away, at the age of eighty.

Sir John Tomes, after serving an apprenticeship to a medical man at Evesham, came to London in 1836, and entered at King's College and at the Middlesex Hospital, being at the former a class-mate with the late Sir William Bowman, with whom a life-long friendship thus began.

For two years (1839–40) he resided in the Middlesex Hospital as house-surgeon; and even at this early stage in his career his attention became turned towards the histology of bone and teeth, and we find him feeding a nest of young sparrows and a sucking-pig upon madder. From a somewhat fragmentary diary which he kept, we find, too, that he then bought from Powell (afterwards Powell and Leland) a microscope, and that he was often spending his evenings with Bowman, Quekett, Kiernan, Todd, Carpenter, and Edward Forbes.

He was an early member of the Microscopical Society, and over a long series of years his contributions to the histology of the hard tissues were numerous. Amongst his more important papers in the *Phil. Trans.* were those on bone (in conjunction with the late Campbell de Morgan), on the dental tissues of marsupials, of rodents, and upon the structure of dentine, this last establishing the existence in dentine of the soft fibrils, ever since known as "Tomes' fibrils."

Like that of his friend Bowman, almost all of his work has stood the test of time, and to this day remains undisturbed. A strong bent towards mechanical invention led him, while still house-surgeon, to revolutionise the construction of tooth forceps, which thenceforward supplanted the old "key" instrument; and at the advice of the late Sir Thomas Watson, he determined to devote himself to the practice of dental surgery, in which the busiest years of his life were spent.

Dr. Morton, a dentist of Boston, Mass., having introduced the use of ether in 1846, we find from Sir John's diary that he was early in the field as an experimenter with this anæsthetic. After sundry experiences with it for tooth extraction at the Middlesex Hospital, some successful and some not, we read: "Gave ether to Arnott's case of lithotomy eight minutes, and insensibility came—the operation then commenced and lasted twelve minutes." (Jan. 14, 1847.) And after notes of many administrations: "Gave ether to eight patients for operations with great success. Earl of Cadogan (a governor of the hospital) and many others present." (Feb. 23, 1847.)

His lectures on dental physiology and surgery were perhaps the first in which the subject was treated from a true scientific standpoint, and when published became quite a classic. But it is curious to read in his diary a resolve that he really will not deliver any more lectures unless he has a class of at least six students.

In 1883 the College of Surgeons, exercising their right to confer honorary fellowships of the College, elected Sir John Tomes and the late Prof. Huxley.

In 1886 he obtained the honour of knighthood, in recognition of his great services to the cause of dental education, and to the establishment of a dental diploma and its recognition by Parliament, his unbroken success in all that he undertook being largely due to his excellent business capacity, and to the respect, trust, and liking which he inspired in all with whom he came in contact.

NOTES.

WE understand that a Civil List pension of £200 has been granted to Mrs. Huxley.

THE following have been elected Associates and Correspondents of the Reale Accademia dei Lincei:—National Associates, Prof. L. Luciani and Prof. G. Tizzoni; Correspondents, Prof. E. Cesàro, Prof. A. Riccò, and Prof. Carlo de Stefani; Foreign Associates in Mathematics, Prof. C. Jordan and Dr. G. Salmon; in Astronomy, Prof. Simon Newcomb; in Physics, Prof. H. J. Wild; in Morphology, Prof. A. Kölliker.

The following are among the recent appointments abroad:—Dr. R. Behrend to be Professor of Chemistry in the Technische Hochschule of Hanover; Dr. X. Siefert to be Professor of Forestry at the Technische Hochschule of Karlsruhe; Dr. F. Richarz to be Professor of Physics in the University of Griefswald; Dr. P. Stäckel to be Assistant Professor of Mathematics in Königsberg University; Dr. O. Wiener to be Professor of Physics in the University of Giessen.

REUTER'S correspondent at Wellington reports that a severe earthquake shock was felt at Taupo, in the district of Tauranga, and at some other places in New Zealand, on Saturday last. An earthquake was also felt over the greater part of Peru, but principally in the south, on Monday.

WE learn from *Das Wetter* that the efforts which have been made during the last fifteen years for the re-establishment of a meteorological observatory on the Brocken, have at last been crowned with success, and, if unforeseen difficulties do not arise, it is expected that this important station will be in working order during the coming autumn. This successful issue is mostly owing to the support given to the undertaking by the Ministry of Public Worship and the Meteorological Institute of Berlin, and by the Brunswick and Hanover sections of the German and Austrian Alpine Club. There can be no doubt that observations from this mountain observatory will be of considerable value for the progress of meteorological science.

AS already announced in these columns, the sixty-seventh meeting of German physicians and men of science will take place at Lübeck on September 16 to 21. Members and visitors will be received at the Town Hall on Sunday, the 15th, at 8 p.m. Business will commence on Monday at 11 a.m. in the Gymnastic Hall with a presidential address, followed by some medical papers. At 3 p.m. the sections will be formed, and at 7 p.m. there will be a social gathering at the Tivoli. Among the entertainments of the following days, are a garden party given by the Senate of the Free Hansa City of Lübeck on Tuesday, a grand ball in the theatre on Thursday, and an excursion to the lakes of East Holstein on the Saturday. Medical papers are announced by Drs. Klebs, Behring, Riedel, and Rindfleisch, and general scientific papers by Drs. Victor Meyer, Ostwald, and others. Senator Dr. Brehmer and Dr. Theodor Eschenburg are the secretaries of the meeting.

THE *Board of Trade Journal* reports that an industrial exhibition, to celebrate the jubilee of the recognition of Berlin as the capital of the German Empire, is to be held next year in the Treptow Park, near that town, from May to October. The exhibition will embrace the following groups:—(1) Textile industries; (2) Clothing industries; (3) Building and engineering; (4) Wood industries (cabinet-making, &c.); (5) Porcelain, glass and fire-brick industry; (6) Smallwares and fancy goods; (7) Metal industry; (8) Engraving, the decorative arts, and the book trades; (9) Chemical industry; (10) Food products (including tobacco, spirits, &c.); (11) Scientific instruments; (12) Musical instruments; (13) Machine-construction, shipbuilding, and transport trade; (14) Applied electricity; (15) Leather and india-rubber industry; (16) Paper industry; (17) Photography; (18) Hygiene, and sanitary dwellings; (19) Education and instruction; (20) Fishing and boating, as industries and sports; (21) Riding and racing, aquatic sport; cycling, shooting and hunting, pleasure-boating; (22) Horticulture; (23 German colonial exhibition; (24) Hotel and restaurant trades.

THE Council of the Federated Institution of Mining Engineers have had for some time under their consideration the holding of meetings of the student members, and the first meeting of students was successfully held in the North of England district on August 13, 14, and 15. With a view to interest the students more especially in the proceedings of the first meeting, a prize was offered by the Institution for the best essay on "The Prevention of Accidents in Mines." The prize was obtained by Mr. Austin Kirkup, whose essay deals concisely with the commonest forms of mining accidents, and sets forth the results of the experience of practical men on their prevention. Mr. Kirkup has based his facts almost entirely on the knowledge which practical experience and observation have afforded him, so his essay possesses a real value, and we regret that pressure upon our space prevents us from doing more than refer to it. In order that the meeting in connection with which the paper was prepared might be of a thoroughly practical character, the students who took part in the proceedings made lengthy underground visits to the Wearmouth and Eppleton Collieries, and were given every information as to the mode of working, haulage, ventilation, &c., practised at these extensive collieries. The Institution is to be congratulated upon its new departure, which is certainly calculated to give the students a wider knowledge of mining than they would otherwise obtain.

WE have received the official programme of the prizes offered for 1896 by the Société Industrielle de Mulhouse. A prize of 1250 francs is offered for a complete history of one of the principal branches of Alsatian industry, such as spinning and weaving cotton and wool, printing woollen and cotton fabrics, machinery, &c. The Hubner prize, represented by a *médaille d'honneur* and 1000 francs, is offered for the best memoir on the carding of spun textile materials during the period which has elapsed since the last publication on the subject, or for the improvement which, in the opinion of the Society, shall have contributed most to the development of carding operations. Similar prizes are offered for a substance which, in the coloured cloth industry, can replace the dry albumen of eggs, and is cheaper than this substance; and for a colourless blood albumen which does not colour on steaming. Silver medals and prizes of 500 francs each are offered for a new and simple means of determining the amount of priming in steam boilers; for a new and advantageous mode of constructing buildings suitable for cotton and wool spinning and weaving, or the manufacture of dyed cloth; new and practical researches on the movement and cooling of steam in long conduits; a registering pyrometer for steam boiler fires; a memoir on the spinning of carded wool; and for a complete memoir on the drying of tissues. Besides these prizes, medals of various grades are offered in some 140 subjects connected with chemical and mechanical arts, agriculture, commerce, history, and fine arts. The competitions are international, but it does not appear from the programme whether French is to be the only language permitted. The memoirs, designs, samples, &c., must be marked by a device or motto chosen by the author, and addressed to the President of the Society before February 15, 1896, together with a sealed envelope containing the exact name and address of the competitor.

MR. T. H. BICKERTON pointed out, at the recent meeting of the British Medical Association, that when the inquiry was arranged into the disastrous collision between the *Elbe* and the *Crathie*, it was stated that "the question of the powers of vision will be carefully borne in mind in the Board of Trade inquiry into the cause of the collision." The inquiry has now been concluded, but it appears that the witnesses were not examined as to their eyesight. This act of negligence will need a deal of explaining. The reading of Mr. Bickerton's paper was followed by the adoption, on the proposal of Dr. Farquharson, M.P., of a resolution that the matter should at an early date be brought to the notice of Parliament, which should be asked to insist that adequate tests should be compulsorily applied before a lad is apprenticed to the sea; that the Royal Society's recommendations should be acted on by the Board of Trade in their entirety; and that officers already holding certificates, and now by the institution of adequate tests found colour blind, should have shore berths given them in Government offices.

THE morphological place of moulds and yeasts, respectively, has long been the subject of speculation and research, some authorities regarding yeasts as having an independent existence, others considering them as only transitory forms in the life-history of moulds. Most important and interesting contributions to this subject have recently been furnished by the experiments carried on in Dr. Jörgensen's laboratory in Copenhagen. In the course of some researches on the diastatic power of the well-known Japanese mould *Aspergillus oryzæ*, Juhler found that in the flasks in which this mycelium had converted rice-starch into sugar, it had produced a growth of typical alcohol producing saccharomyces cells. This most interesting observation was subsequently confirmed by Jörgensen, who has since endeavoured to ascertain if the various types of alcohol producing yeasts can be traced to particular moulds, and already he has succeeded in demonstrating the evolution of wine yeast cells from a particular mould extensively present on grapes. Dr. Jörgensen intends to continue these most suggestive investigations, and publish his results from time to time in the form of a separate *Bericht* exclusively devoted to the work carried out in his laboratory. In pursuing these researches Dr. Jörgensen will not only render great practical service to the science of fermentation, but he will also lay botanists under deep obligation to him for having rendered possible a more extended and accurate insight into the life-history of moulds.

THE annual address on "The Recent Evolution of Surgery," delivered before the Medical Society of London in May last, by Mr. A. Pearce Gould, has been published in the form of a dainty brochure by Messrs. Kegan Paul and Co.

THE *Transactions* have reached us of the Ballarat meeting (1894) of the Australasian Institute of Mining Engineers. Among the papers contained therein, we notice a review of past and present steam pumping in mines, by Mr. J. Tipping; an address on the mineral wealth of Victoria, by Mr. James Stirling; an account of the physiography and geology of the Wadnaminga Gold Field, by Mr. F. D. Johnson; notes on the White Cliffs Offal Fields, Wilcannia, by Mr. F. G. de V. Gipps; and a description of ore-dressing by automatic machinery, by Mr. H. W. F. Kayser.

WE have received from Dr. G. Hellmann, of Berlin, a revised edition of "Meteorologische Volksbücher," which first appeared in *Himmel und Erde* in 1891 (see NATURE, vol. xliv. p. 185). The work contains an account of the earliest popular German treatises on natural science and meteorology from the first encyclopedia, "Lucidarius," which was written more than two centuries before the invention of printing, to the "Hundred-year Calendar" of Dr. Knauer, for the years 1701–1801. Dr. Hellmann has embellished the work by further biographical notes and additions based upon his laborious researches since the appearance of the first edition.

THE forty-first annual report of the Trustees of the Australian Museum is not a pleasing one. We read: "The continued smallness of the income allowed to the Trustees by Parliament has practically stopped the acquisition of specimens by purchase or collection. The amount expended in the purchase of specimens [during 1894] does not exceed £20. No collecting expeditions have been sent out, all that has been done in this way being confined to flying trips around Sydney. . . . The staff still continues at its reduced strength, and the forced economies of late years are beginning to tell on the efficiency of the Institution." It is really time that something was done to alter this unsatisfactory state of things; for the present conditions hamper the usefulness of the museum, and are most detrimental to the interests of science. A few researches have been carried on by the officers of the museum, and the mention of them gives a little light to an otherwise rather discouraging report.

MESSRS. GEORGE PHILIP AND SON have published a school edition of the "Systematic Atlas." The atlas has been specially arranged for the use of students in higher schools and training colleges. Though an abridgement of the "Systematic Atlas," it contains as many as 170 maps—practically all the general ones—in forty-one plates, and a complete index of more than 12,000 names. The atlas will be very valuable for class work in physical and political geography, and is a useful introduction to the larger edition, which has already been reviewed in these columns. Another atlas, of which Messrs. Philip have just published a new edition, is the "Handy-Volume Atlas of the World," by Mr. E. G. Ravenstein. This, however, is almost a new work, for the whole of the maps have been re-drawn and re-engraved, and the letterpress accompanying them has been rewritten. We reviewed the original edition when it appeared some years ago; and it is only necessary now to say that the present volume, like its predecessor, is a compact and an efficient pocket-atlas.

THE second part of the fifty-first volume of the *Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande, Westfalens und der Reg. Bezirks Osnabrück* (Bonn, 1894), contains six memoirs and a series of shorter papers and notes. The first memoir is a list of the fossils derived from northern regions found in the diluvial deposits of Westphalia, which is contributed by Dr. W. von der Marck. Laspreyes has issued a detailed study of the meteorites in the museum of the University of Bonn, in which the literature is tabulated with great care. Stockfleth describes the iron-ore deposits in the Hill of Huggel, near Osnabruck, where it occurs in the Zechstein. C. Roettgen gives a "Contribution to the Coleoptera Fauna of the Rhine Province." H. Pohlig continues his study of abnormal deer antlers by a description of two pairs belonging to the great Irish elk. One of these has a brow tyne on the left side, but no trace of one on the right, whereas the first of the serial tynes on that side is branched. In the other case both brow tynes are present, but the second serial tyne on the left side has a rudimentary branch. Dr. Verhöff contributes a short paper on the biology of the fire-fly *Phosphænus hemipterus.* Among the smaller papers, a note by Ludwig gives a brief account of Marchiafava and Celli's work on the malaria parasite; Philippson summarises the geological problems that still await solution in Western Turkey. Schenck gives a brief demonstration of the structure of the Brazilian lianas, or climbing stems.

THE additions to the Zoological Society's Gardens during the past week include a Ruffed Lemur (*Lemur varius*, ♀) from Madagascar, presented by Mr. J. H. Bingham; a Vervet Monkey (*Cercopithecus lalandii*, ♀) from South Africa, presented by Mrs. C. J. Humphrey; a Mozambique Monkey (*Cercopithecus pygerythrus*, ♀) from East Africa, presented by Mrs. John Mahon; a Sooty Mangabey (*Cercocebus fuliginosus*, ♀) from West Africa, presented by Mr. Davies; a Sykes's Monkey (*Cercopithecus albigularis*, ♂) from East Africa, presented by Mr. J. Watkinson Brown; a Cheetah (*Cynælurus jubatus*), a Blotched Genet (*Genetta tigrina*) from Somaliland, presented by Mr. J. L. Harrington; a Martial Hawk Eagle (*Spizætus bellicosus*) from British East Africa, presented by Captain B. L. Sclater; two Ravens (*Corvus corax*), two Buzzards (*Buteo vulgaris*), two Greater Black-backed Gulls (*Larus marinus*), European, presented by the Hon. William Edwards; a Herring Gull (*Larus argentatus*), British, presented by Mr. George Hawes; two Orbicular Horned Lizards (*Phrynosoma orbiculare*) from Mexico, presented by Mr. Bernard Jackson; a Rhesus Monkey (*Macacus rhesus*, ♀) from India, a Black-backed Jackal (*Canis mesomelas*) from South Africa, four Spiny-tailed Mastigures (*Uromastix acanthinurus*) from North Africa, deposited; two —— Octodons (*Ctenodactylus gundi*) from Egypt, purchased, three Dorcas Gazelles (*Gazella dorcas*, ♀ ♀ ♀) a Sœmmerring's Gazelle (*Gazella sœmmerringi*, ♂), an Egyptian Cat (*Felis chaus*), three Libyan Zorillas (*Ictonyx lybica*), ten Varied Field Rats (*Isomys variegatus*), thirty-five Hairy-footed Jerboas (*Dipus hirtipes*), forty-five Lesser Egyptian Gerbilles (*Gerbillus ægyptius*), eight Larger Egyptian Gerbilles (*Gerbillus pyramidum*), two Egyptian Kites (*Milvus ægyptius*), a Cerastes Viper (*Vipera cerastes*) from Egypt, received in exchange; a Spotted Pigeon (*Columba maculosa*), bred in the Gardens.